



PROPOSED PLAN

for Interim Remedy

Site 2 - Former Fire Training Area

Soil, Groundwater, and Potential

Munitions and Explosives of Concern

Introduction

This **Proposed Plan** and Statement of Basis for Remedy Selection identifies the preferred alternative to address volatile organic compound (VOC) and polycyclic aromatic hydrocarbon (PAH)-contaminated subsurface soil, VOC-contaminated **groundwater**, and potential residual munitions and explosives of concern (MEC) at Site 2 - Former Fire Training Area, Naval Weapons Industrial Reserve Plant (NWIRP), Calverton, New York (Figures 1 and 2). The preferred alternative presented in this document will serve as a final remedy for these concerns. However, because of the presence of several emerging contaminants in site groundwater, this preferred alternative will be an interim remedy for the Site.

A separate investigation is being planned to investigate the emerging contaminants - perfluorooctane acid (PFOA) and perfluorooctane sulfonate (PFOS), which are associated fire fighting foam and were recently detected in site groundwater. The findings of the investigation will determine if PFOA and PFOS present

an unacceptable human health or environmental risk at the site. If an action is required to address this risk, the final selected remedy would be documented in a separate, site-wide decision document.

This document provides the rationale for the preferred alternative and summarizes other cleanup alternatives evaluated for use at this site. The preferred alternative consists of **Land Use Controls (LUCs)** to prevent human exposure to contaminated subsurface soil and groundwater while contaminants remain above cleanup levels; **monitoring** to evaluate contamination migration and the effectiveness of cleanup in groundwater; and treatment of additional **source areas** where there is evidence of petroleum or chlorinated solvent source material. In addition, to address potential residual MEC, material would be consolidated on-property, and surface clearing of the site would be conducted, followed by stabilization of the ground surface to control erosion and LUCs would be implemented. See page 13 for more detail on the preferred cleanup alternative.

***Bold words are defined in the Glossary.**

Mark Your Calendar for the Public Comment Period

Public Comment Period

March 16, 2017 - May 15, 2017

Submit Written Comments



The Navy will accept written comments on the Proposed Plan during the public comment period. To submit comments or obtain further information, please refer to the insert page.

Location of the Information Repository

Riverhead Free Library
330 Court Street
Riverhead, New York 11901-2885
(631) 727-3228

Attend the Public Meeting

Date: April 4, 2017

Time - 5:30 to 7:00 pm

Place - Calverton Community Center, Grumman Boulevard, Calverton, New York

The Navy will hold a public meeting to explain the Proposed Plan. Verbal and written comments will be accepted at this meeting.

Public Affairs Officer
Code 09PA

Naval Facilities Engineering Command, Mid-Atlantic
9324 Virginia Ave. Room 302
Norfolk, VA 23511-330

The administrative record for the facility is maintained online at:
<http://go.usa.gov/cSJ3T>

The Navy is the lead federal agency under the **National Oil and Hazardous Substances Pollution Contingency Plan (NCP)**, 40 Code of Federal Regulations (CFR) Part 300, and Executive Order 12580, as amended by Executive Order 13016, for **Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)** response activities at Calverton and under the **Defense Environmental Restoration Program (ERP)** amendments of 10 United States Code §2701, et seq.. **New York State Department of Environmental Conservation (NYSDEC)** is the lead regulatory agency in accordance with the requirements of the New York State **Resource Conservation and Recovery Act (RCRA)** Hazardous Waste Permit for the facility (NYSDEC 1-4730-00013/00001-0) dated March 25, 1992. The **United States Environmental Protection Agency (USEPA)** supports NYSDEC in its oversight activities in accordance with the requirements of the previous USEPA facility permit (USEPA ID Number NYD003995198) dated May 11, 1992. NWIRP Calverton is also listed as a New York State Superfund site (Site Code 152136) and, as such, the Navy also addresses the requirements of Title 6 of the New York Codes, Rules, and Regulations (NYCRR), Part 375 through the Applicable or Relevant and Appropriate Requirements

(ARARs) process of CERCLA.

This **Proposed Plan** and Statement of Basis for Remedy Selection has been prepared as a condition of the existing RCRA Part 373 Permit for the former NWIRP located in Calverton, Suffolk County, New York. The purpose of this report is to support a major modification of the former NWIRP Calverton Facility Part 373 Permit in accordance with 6NYCRR 373-1.7(b) and 621.1310 for the proposed corrective measures for Site 2.

The proposed Plan is a document that the Navy is issuing in accordance with the requirements of **CERCLA** §117(a) and the NCP.

This Proposed Plan also summarizes information that can be found in greater detail in the September 2016 **Feasibility Study (FS)/Corrective Measures Study (CMS)** and other documents contained in the Administrative Record file for this site. The Navy encourages the public to review these documents to gain a more comprehensive understanding of the site and remedial activities that have been conducted.

The Navy, in consultation with the NYSDEC pursuant to 10 United States Code (U.S.C) §2705(a) and (b) and 42 U.S.C. §9620(f), will select an interim remedy for the site after reviewing and considering all information submitted

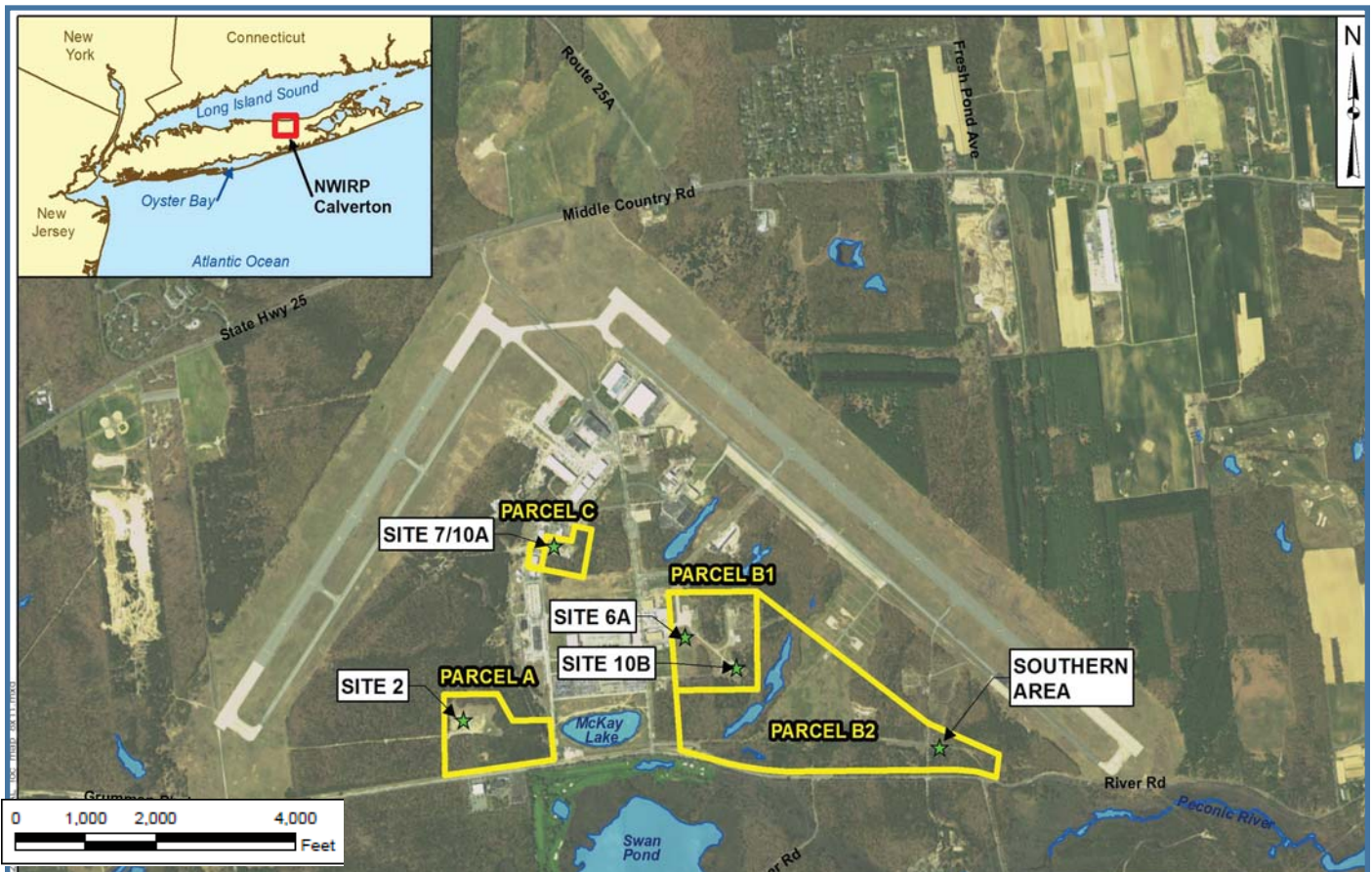


Figure 1 - Facility Location



Figure 2 — Site Map

during the 60-day **public comment period**. The Preferred Alternative may be modified or another response action presented in this plan may be selected based on new information obtained from public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan.

Site Background

NWIRP Calverton originally included over 6,000 acres. The Former Fire Training Area (Site 2) is located on the remaining 209 acres (Sites 2, 7, 6A/10B/Southern Area) being retained by the Navy to continue Environmental Restoration Program (ERP) activities. Site 2 - Former Fire Training Area is located in the south-central portion of the facility (Figures 1 and 2).

NWIRP Calverton was used for agricultural purposes prior to 1950. The Former Fire Training Area was active from the 1950's until 1996. From approximately 1950 to 1982, activities at the Fire Training Area consisted of clearing an area up to 100 feet or more in diameter and enclosing it with an earthen berm. A layer of water filled the bermed area. Waste fuels, oils, and waste solvents, [with some containing low levels of polychlorinated biphenyls (PCBs)] were floated on the water, ignited, and then extinguished. Waste oils and solvents were stored onsite, in a 6,000-gallon partially buried tank located north

of the Fire Training Area. Aircraft sections were sometimes placed in the area to simulate actual crash conditions. After 1975, waste solvents were reportedly no longer mixed with the waste fuels and oils to be ignited. A curbed, concrete pit approximately 50 feet in diameter was constructed in 1982 and the use of earthen berms was discontinued.

In 1982 and 1983, two spills of waste oil were reported at the Fire Training Area. As a result of these two spills, the entire Fire Training Area was upgraded. An 80-foot diameter concrete burn ring was installed at the southeast portion of Site 2 to contain the waste oil and water used in the training exercises. Piping in the area was modified to prevent spills. A 1,000-gallon aboveground storage tank (AST) was installed 75 feet north of the concrete ring to replace the 6,000-gallon storage tank. In 1996, fire training activities at the site ceased.

Previous Remedial Activities and Environmental Investigations

Between 1987 through 2015, several remedial activities and environmental investigations were conducted to address soil and groundwater contamination, and potential residual MEC at the site. Documents providing details of these activities may be found at the **Information Repository** and in the **Administrative Record**. A

summary of these remedial activities and environmental investigations are provided below:

- In 1986, an Initial Assessment Study (IAS) was performed for the NWIRP Calverton. This study identified seven potential areas of concern, including Site 2. As a follow-up to the IAS, a Site Investigation (SI) was conducted at NWIRP Calverton, which was classified as a landfill-type site or a site resulting from documented or suspected historical spills or leaks of fuels, oils, or solvents.
 - In 1987, contaminated soils from the 1982 and 1983 spills were removed and disposed offsite. Monitoring wells were installed in the areas of the spills to monitor potential groundwater contamination resulting from the incidents. Floating free product was identified in several of these monitoring wells. A groundwater recovery well and oil-water separation system was also installed to remove residual free product from petroleum-contaminated soil at the site. This system operated until 1996. Approximately 325 gallons of petroleum product was removed from this site during this time. The 1,000 gallon AST was removed in 1996.
 - A RCRA Facility Investigation (RFI) was conducted in 1994 and 1995. Solvent and VOCs related to fuel were detected in soils. The fire training pit was identified as the most likely primary source area. PCBs, pesticides, and semivolatile organic compounds (SVOCs), including PAHs and phthalates were also detected in several soil samples. Metals including antimony, lead, and selenium were detected in soil at concentrations greater than background levels. One drum was found on the surface of the site and was removed during a separate interim action.
 - Groundwater testing detected the following VOCs at concentrations either above federal **Maximum Contaminant Levels (MCLs)** or New York groundwater quality standards: chloroethane, 1,1-dichloroethane, toluene, 1,1,1-trichloroethane (TCA), Trichloroethene (TCE), and xylenes. PCBs, PAHs, and lead were detected at concentrations above either federal MCLs or state groundwater quality standards. Floating free product was also identified at Site 2. In addition, the location of the free product corresponded to the location of the most contaminated groundwater.
 - A pilot study was conducted in 1995 to assess the effectiveness of **air sparge/soil vapor extraction (AS/SVE)** technology to remove VOCs in site soil and groundwater. The AS/SVE system was constructed in the summer of 1995 and operated from August to December 1995. During this period, the system removed 46 pounds of chlorinated VOCs and 8 pounds of target non-chlorinated VOCs. Based on carbon dioxide measurements, up to 13,000 pounds of organics (as carbon) were destroyed by biological degradation during the trial.
 - The AS/SVE system continued to operate seasonally (March to December) until December 2000. From 1995 to December 2000, this system contributed to the biodegradation of approximately 50,000 pounds of hydrocarbons.
 - In 2001, a Phase 2 RFI was conducted to further investigate the eastern extent of on-site groundwater contamination and to determine whether on-site groundwater had migrated off-site. During this investigation, groundwater contamination was found to be near the downgradient fence line. The groundwater contamination at Site 2 is not continuous and several pockets of discrete contamination are most likely present.
 - In 2005, a subsurface soil investigation was conducted to delineate the extent of waste and contaminated materials at Site 2. Based on this delineation, an Engineering Evaluation and Cost Analysis (EE/CA) was prepared to evaluate additional remedial alternatives. The EE/CA recommended a Non-Time Critical Removal Action (NTCRA) to remove and dispose of shallow petroleum-contaminated soil from the site.
 - In 2008, a NTCRA was conducted at Site 2 to remove shallow petroleum-contaminated soil. Construction activities were conducted between October 2008 and June 2009, most of the contaminated soil, the AS/SVE system, and the concrete burn ring were removed. Approximately 10,860 tons of soil contaminated with petroleum (up to 6 feet below grade) and 546 tons (up to 2 feet below grade) of surficial soil over 1.1 acres were excavated and hauled off property. After excavation, an **Oxygen Releasing Compound (ORC)** was applied to the excavation floor to accelerate degradation of residual organic compounds. The pit was then backfilled with clean fill, regraded, and vegetated.
- During the excavation, an area of PAH contamination was identified, west of the removal, but remained in place because it could not be accessed at the time.

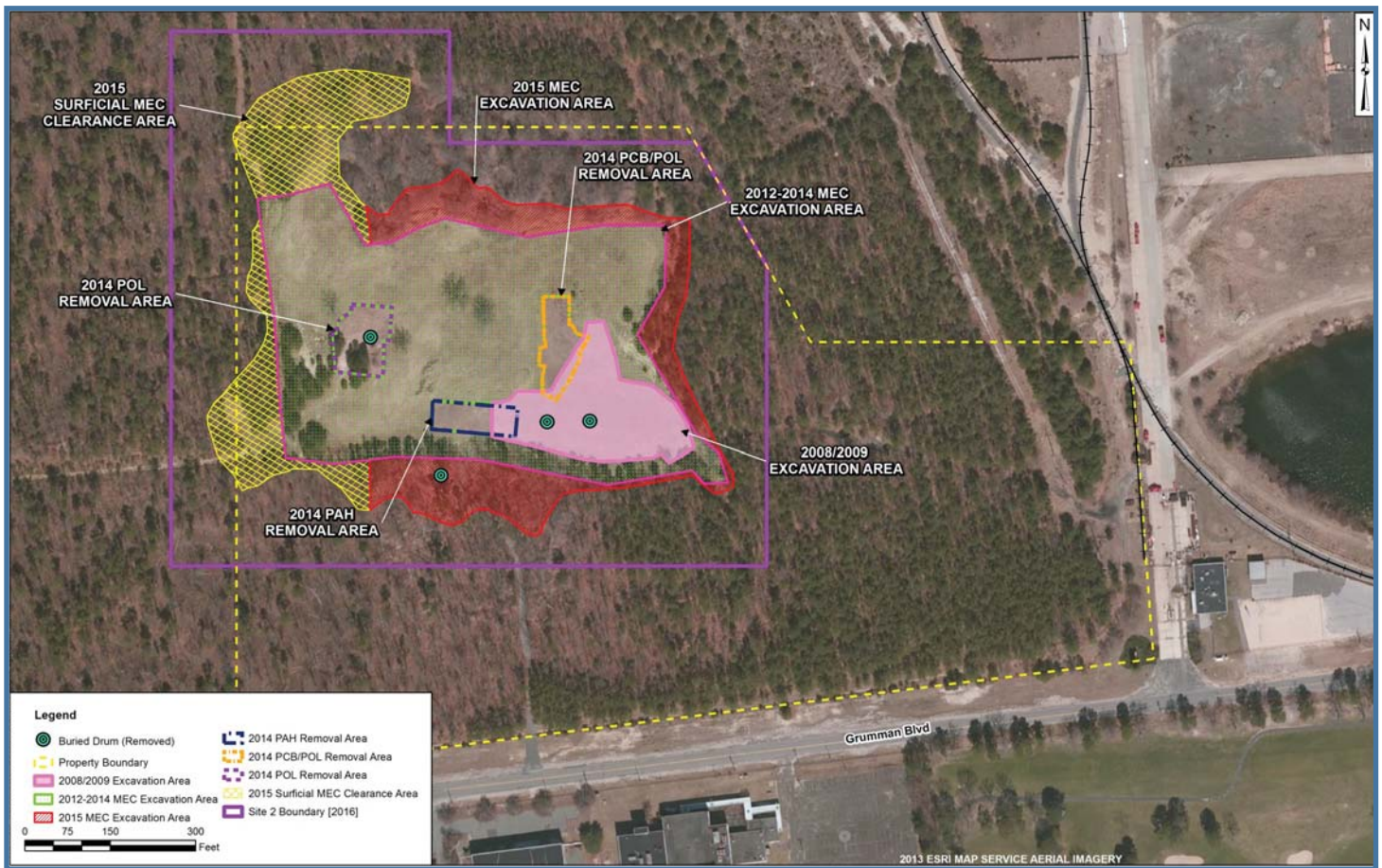


Figure 3 — Soil and MEC removal actions (Post 2008)

Several drums were encountered during the NTCRA. Some drums contained either oily water or tar-like solids, or were empty. The contents of these drums were confirmed as non-hazardous. These drums were removed and properly disposed of offsite.

- In February 2010, during a soil sampling event to support a planned future soil excavation (“2014 PAH Removal Area”, Figure 3), potential MEC was encountered. In March 2010, an Explosive Ordnance Disposal (EOD) technician inspected the materials and removed them from the site. The materials were likely from a firing stop butt area where aircraft 20-millimeter (mm) cannon firing systems were tested. The butt area was located on NWIRP Calverton, approximately 3,500 feet to the east of Site 2. As the plant closed and the facilities were decommissioned, the aircraft firing stop butt was abandoned in place and the soil was removed
- In 2010, a digital geophysical mapping survey (DGM) was conducted to identify metal objects at the Site 2 clearing. This survey was used to support a 2011 Explosive Safety Submission Determination Request (ESS DR) and subsequent MEC removal program.
- In 2012, a supplemental investigation to the Phase 2 RFI was conducted to evaluate the effects of several interim response actions by evaluating soil and groundwater quality at the site and in areas downgradient of NWIRP. In addition, a **Human Health Risk Assessment (HHRA)** was conducted using analytical data from soil and groundwater samples collected from this investigation.
- In 2012, MEC response actions commenced at the site. Activities included, manual / mechanical excavation, screening, and backfill of 5.8 acres to a minimum depth of 18 inches below ground surface (bgs). Suspected MEC and material potentially presenting an explosive hazard (MPPEH) were encountered throughout the area and were classified as 20-mm projectiles or pieces of 20-mm projectiles. Approximately 17,010 20-mm projectiles or pieces of projectiles were recovered and disposed of onsite by controlled demolition. Three drums of paint waste were encountered at the western portion of the Site 2 clearing designated as “2014 POL (petroleum, oil, and lubricants) Removal Area” (Figure 3) and were characterized, transported, and disposed off-site. In addition, soil contamination was identified north west

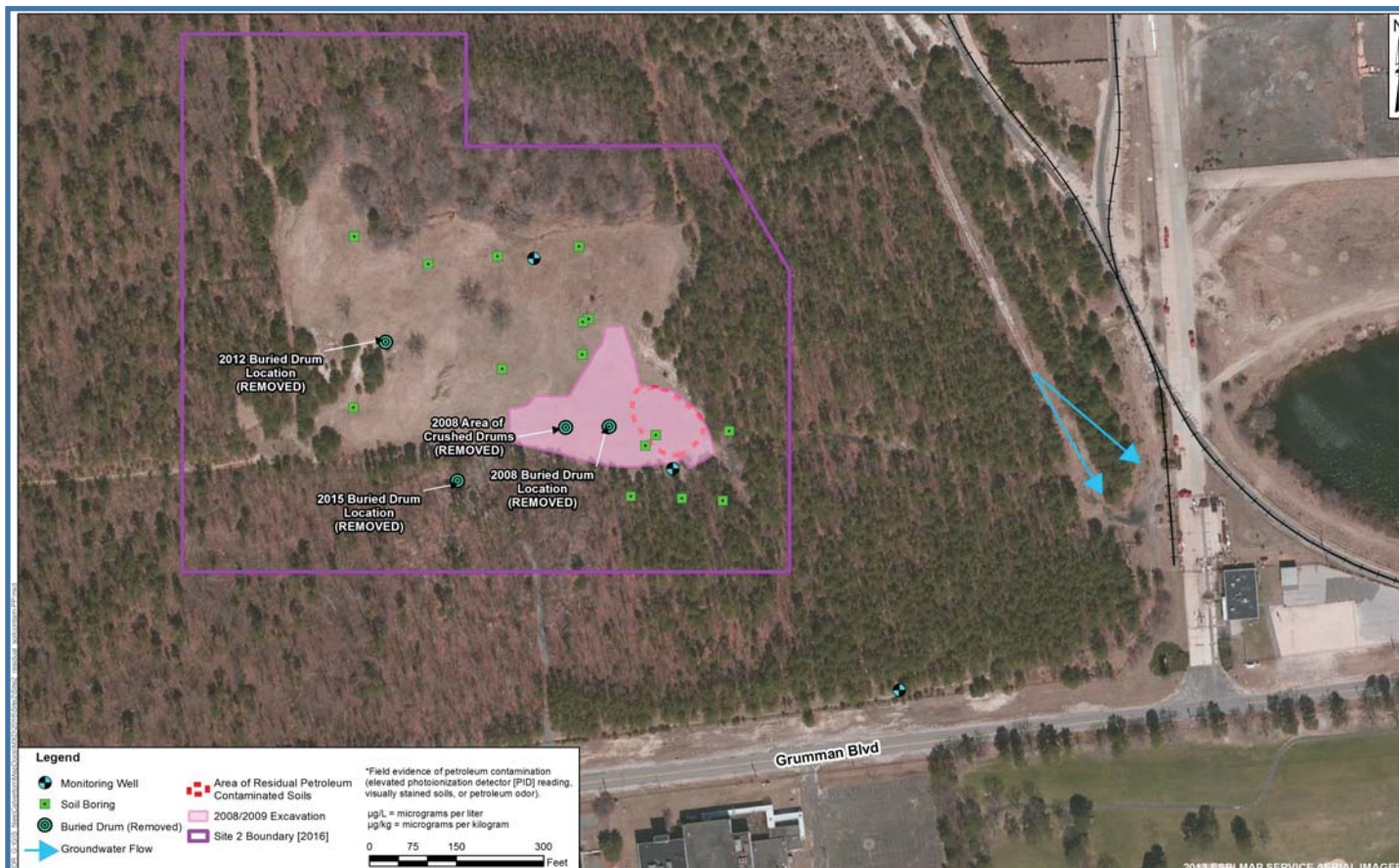


Figure 4 — Extent of Residual Soil Contamination

of the 2008/2009 excavation area designated as the “2014 PCB/POL Removal Area” (Figure 3) and soil sample results indicated the presence of low level PCBs.

In May and June 2013, a supplemental DGM survey was conducted and indicated that an additional 3.6 acres of debris area surrounding the Site 2 clearing may contain MEC.

- In 2014, excavation of “PAH Removal Area” soils (identified during the 2008/2009 NTRCA), the “2014 POL Removal Area”, and the “2014 PCB/POL Removal Area” identified during the 2012 MEC response was conducted (Figure 3). Approximately 4,100 cubic yards of soil was excavated, screened, and reused as fill material. However, some excavated soil did not meet onsite re-use criteria; and therefore, was properly disposed offsite. A total of 1,012 20-mm projectiles or pieces of projectiles were recovered. Seven weathered drums (and remnants of crushed drums) were encountered at the “2014 POL Removal Area”. The drums contained oil-like waste, Freon, and paint-like waste. Excavation continued in this area until the presence of drums were no longer observed and confirmation sampling of soil indicated that contamination was no

longer present.

- In 2015, additional MEC response actions were conducted. Approximately 1.8 acres around the edge of Site 2 were cleared to a minimum of 18 inches bgs (“2015 MEC Excavation Area”, Figure 3). Approximately 4,152 cubic yards of soil was excavated, screened, and reused as backfill. A total of 1,171 20-mm projectiles or pieces of projectiles were recovered. An additional 1.8 acres around the edge of Site 2 were surface cleared (“2015 Surficial MEC Clearance Area”, Figure 3). Approximately six drums and drum remnants with tar were encountered and removed from the southern edge of the Site 2 clearing (2015 Buried Drum Location, Figure 4).

Site Characteristics

Site 2 – Former Fire Training Area is located within a 10.5-acre clearing (Figure 2). The clearing has been reworked and expanded during the response and MEC clearance activities. Overall, the clearing slopes uniformly to the southeast (2 to 3 percent). It is lightly vegetated, with some minor erosion noted in portions of the site with steeper slopes. It is surrounded by mature woodlands (Figure 2). Access to the site is from Grumman Boulevard to the south via a gravel road and a

locked gate.

Nature and Extent of Contamination

The following section provides a current description of soil and groundwater contamination at Site 2.

Subsurface Soil

The site-related **Chemicals of Concern (COC)** in subsurface soil at Site 2 consist of xylenes, which are VOCs (see Table 1). Xylenes were detected at 2,500 micrograms per kilogram ($\mu\text{g}/\text{kg}$) in an area of known residual petroleum contamination in the southeast portion of the Site (Figure 4). The conservative estimated areal extent of xylene-contaminated subsurface soil is 90 feet by 125 feet at a depth of 12 to 20 feet bgs, or approximately 3,300 cubic yards, and contains approximately 8.1 pounds of xylenes and 52,000 pounds (26 tons) of petroleum. The residual petroleum contamination is a smear zone associated with former free product that formed during previous fluctuations in the water table (shallow groundwater across Site 2 fluctuates from approximately 10 to 20 feet below ground surface [bgs]). The residual petroleum smear zone includes both saturated and unsaturated (capillary zone) soils.

Groundwater

Two separate VOC-contaminated groundwater plumes

are present at the Site (Figure 5). The primary area of contamination consists of a VOC plume originating in the western portion of the Site 2 clearing and extends off property. On property, the Western (TCE) plume is approximately 10 feet thick and 350 feet wide at its widest point, and extends southeast at least to the NWIRP fence line (property line). Based on an ongoing off property groundwater investigation, the groundwater plume continues approximately 6,000 feet to the southeast to near Donahue Lake (Figures 6). A smaller plume, isolated to on-site property, is situated in the eastern portion of the Site (Figure 5).

The COCs for groundwater include solvent and fuel related VOCs (see Table 2). TCE is the primary **contaminant** in the groundwater plume. The maximum detection on property of TCE was 49 microgram per liter ($\mu\text{g}/\text{L}$) in a temporary well adjacent to FTMW09I at a depth of 31 to 35 feet bgs during the September 2011 sampling event. Other VOCs, such as TCA and degradation products of TCE and TCA may also be present.

In combination, both plumes contain approximately 0.30 pound of TCE and approximately 0.04 pound of xylenes within 2.9 million gallons of contaminated groundwater on Site 2 property.

Fate and Transport of Contamination

A **Conceptual Site Model (CSM)** conveys what is known



Figure 5 — Groundwater Plume

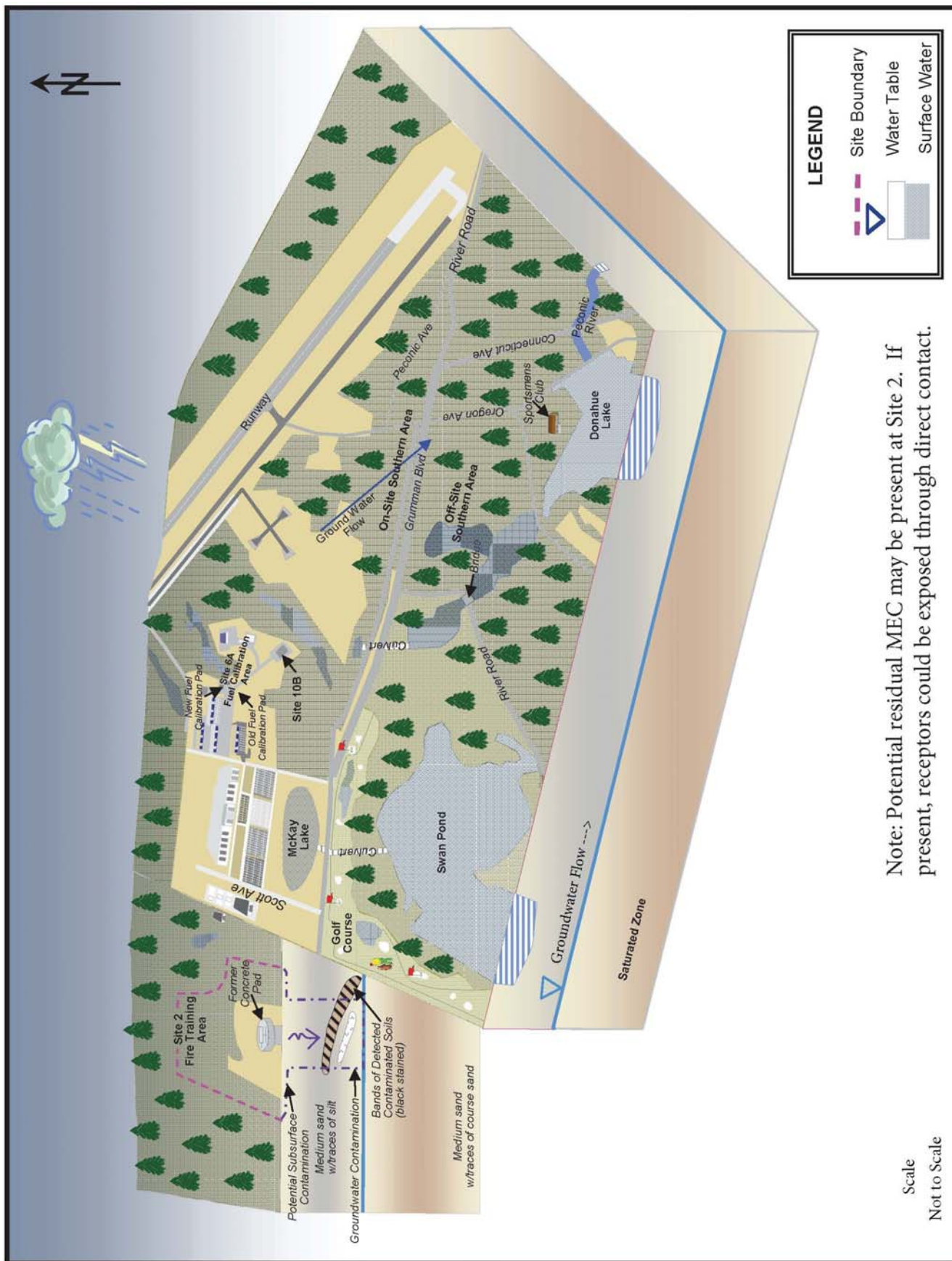


Figure 6 — Conceptual Site Model

What is a “Principal Threat”?

The NCP establishes an expectation that the lead agency will use treatment to address the principal threats posed by a site whenever practical (NCP Section 300.430(a)(1)(iii)(A)). The “principal threat” concept is applied to the characterization of “source materials” at a **superfund** site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, free floating product at the groundwater table may be viewed as a source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

or suspected about contamination sources, release mechanisms, and the transport and fate of those contaminants. It provides a basis for understanding contaminate fate and transportation issues and assessing potential remedial technologies for the site. The CSM for Site 2 is presented on Figure 6.

The primary risk pathways at this site are through potential leaching of xylenes (and other VOCs) in soils or other source material to groundwater, migration and ingestion of groundwater contaminated with VOCs, and possible exposure to VOCs through vapor intrusion into structures and inhalation. There is also the potential for migration of contamination from groundwater to surface water, located approximately 6,800 feet to the southeast. In the river, there is a potential for ecological receptors to be exposed to these chemicals.

In addition to the VOCs in soil and groundwater, residual MEC is potentially present at the site. All known MEC has been removed from the site. The site has no history of MEC use or disposal, but fragments of 20-mm projectiles, consistent with facility aircraft and test firing conducted at another location in the area have been found at Site 2. Based on the 2013 Supplemental DGM survey, MEC has been determined to be limited to a 10.5-acre area at the site. Of the 10.5-acre area, approximately 7.6 acres have been cleared to a minimum depth of 18 inches bgs, 1.1 acres have been cleared to

native soils underlying the site, and the remaining 1.8 acres have been cleared on the surface. When contaminated debris (e.g. drums) were encountered, the excavation extended deeper to allow removal of the drums and contents. During these activities, detected MEC and fragments have been limited to fill material and is not believed to be present in native undisturbed soil generally found at depths of 2 to 5 feet bgs. As a result, residual MEC is potentially present throughout most of the site at depths of 18 inches to approximately 5 feet bgs, and in the remaining 1.8 acres from near the surface to approximately 5 feet bgs.

Principle Threats

From 1987 through 2014, several actions and activities have been conducted at Site 2 to address source material (e.g., free product and drum residues), and resulting soil and groundwater contamination at the site. These actions and activities have included active and passive recovery of free product, operation of an AS/SVE system, removal and off-site disposal of contaminated soil, treatment of contaminated soil via enhanced biological stimulation chemicals, and removal and disposal of buried drums containing VOC and POL substances. These activities and actions have addressed the known sources of contamination at the site. Some highly weathered petroleum-contaminated soil may remain in the southern eastern portion of the site at depths below 10 feet bgs, which is expected to attenuate naturally within the next several years. The Preferred Alternative includes a provision for implementing selective treatment of this underlying soil in areas or where there is evidence of a release of petroleum or chlorinated solvents from another source (e.g., buried drum).

Scope and Roles of the Interim Action

This Proposed Plan presents the Navy’s Preferred Alternative for addressing VOC and PAH contamination in soil and groundwater, and potential residual MEC at Site 2. The Navy’s cleanup strategy for these chemicals and potential residual MEC at Site 2 is summarized as follows:

- Establishment of LUCs to prevent exposure to site contaminants until the Remediation Goals (RGs) are achieved.
- Monitoring of groundwater to evaluate contaminant migration and cleanup, and the potential need to take additional actions.
- Selective treatment of additional source areas such

What is Human Health Risk and How is it Calculated?

A human health risk assessment estimates the “baseline risk.” This is an estimate of the likelihood of health problems occurring if no cleanup action were taken at a site. To estimate the baseline risk at a site, the Navy performs the following four-step process:

Step 1: Analyze Contamination

Step 2: Estimate Exposure

Step 3: Assess Potential Health Dangers

Step 4: Characterize Site Risk

In **Step 1**, the Navy looks at the concentrations of contaminants found at a site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). Comparisons between site-specific concentrations and concentrations reported in past studies help the Navy to determine which contaminants are most likely to pose the greatest threat to human health.

In **Step 2**, the Navy considers the different ways that people might be exposed to the contaminants identified in Step 1, the concentrations that people might be exposed to, and the potential frequency (how often) and length of exposure. Using this information, the Navy calculates a “reasonable maximum exposure” (RME) scenario that portrays the highest level of human exposure that could reasonably be expected to occur.

In **Step 3**, the Navy uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential health risks. The Navy considers two types of risk: (1) cancer risk, and (2) noncancer risk. The likelihood of any kind of cancer resulting from a contaminated site is generally expressed as an upper bound probability. Under CERCLA, the target risk range for establishing cleanup goals is 1 in 10,000 to 1 in 1,000,000. In other words, for every 10,000 or 1,000,000 people that could be exposed, one extra cancer may occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than normally would be expected to from all other causes. For noncancer health effects, the Navy calculates a “hazard index.” The **Hazard Index (HI)** represents the ratio between the “reference dose”, the dosage at which no adverse health effects are expected to occur, and the “reasonable maximum exposure”, the estimated maximum exposure level for a given category of individuals coming into contact with contaminants at the Site. The key concept here is that a “threshold level” (measured usually as a hazard index of less than 1) exists below which noncancer health effects are no longer predicted.

In **Step 4**, the Navy determines whether site risks are great enough to cause health problems for people at or near the site. The results of the three previous steps are combined, evaluated, and summarized. The Navy adds up the potential risks from the individual contaminants and exposure pathways and calculates a total site risk.

as underlying soil and groundwater where there is evidence of continuing or new release of petroleum or chlorinated solvents.

- Consolidation of material on-property and site surface clearing of potential residual MEC, surface stabilization, and long-term LUCs.

Additional source area or other on-site response actions would be considered if, based on monitoring data, it is determined that VOC-contaminated groundwater may adversely impact ecological receptors in the Peconic River. Although this action serves as an interim remedy for Site 2, the Navy intends its preferred alternative, as identified in this Proposed Plan, to be the final response action for VOCs, PAHs, and potential residual MEC at the site.

As indicated in the Introduction of this Proposed Plan, a separate investigation for PFOA and PFOS is being conducted to determine if these compounds have impacted the groundwater. If the findings of the investigation concludes that an action is necessary to address contamination from PFOA and PFOS at the Site, the remedy will be documented in a separate, site-wide decision document.

It is the current judgment of the Navy, in consultation with NYSDEC, that the preferred alternative identified in this Proposed Plan is necessary to protect the public health, welfare, and environment from actual or threatened releases of hazardous substances to the environment.

Future land use is anticipated to be consistent with current land use, which is primarily environmental conservation and recreational use. Since this area is classified as a sole source aquifer, in the future there is a potential that groundwater may be used as a drinking water source. However, there are no current plans for installing potable water wells in this area.

Summary of Site Risks

Human Health Risk Assessment

During the 2012 Supplemental RFI, a HHRA was performed using USEPA, NYSDEC, and Navy-specific guidance to develop the framework of the HHRA. The HHRA was conducted using analytical data from soil and groundwater samples collected from the investigation. There are no receptors at the Site under current land use. Potential receptors under future land use are construction workers, industrial workers, child and adult recreational users, and hypothetical child and adult residents.

Even though surface soils were found to contain PAHs

Table 1 - Soil - Basis and Proposed Remediation Goals (µg/kg)

Chemical of Concern	Site Specific Risk-Based Values	NYSDEC Soil Cleanup Objective for Un Restricted Land Use	NYSDEC Soil Cleanup Goal for Protection of Groundwater	Proposed Remediation Goal
M+p xylenes	59,000	260	1,600	260
O-xylene	69,000	260	1,600	260

and PCBs at concentrations above USEPA **Regional Screening Levels (RSLs)**, a site-specific risk **assessment** did not identify actionable risk (greater than 10^{-4} **Incremental Life-Time Cancer Risk [ILCR]**) for current and potential receptor scenarios. Three PAHs (benzo(a)anthracene, benzo(a)pyrene, and dibenzo(a,h)anthracene) resulted in a 1×10^{-5} ILCR to the hypothetical lifelong (child and adult) resident in subsurface soils. **Hazard Quotients (HQs)** were less than one.

Five VOCs in groundwater (1,4-dichlorobenzene, chloroform, ethylbenzene, TCE, and vinyl chloride) resulted in a combined 1×10^{-4} ILCR to the hypothetical lifelong (child and adult) resident. Individually, vinyl chloride resulted in a risk of 1×10^{-4} ILCR of incidental ingestion to the child resident and lifelong (child and adult) resident.

Potential vapor intrusion issues with 1,4-dichlorobenzene, chloroform, ethylbenzene, TCE, and vinyl chloride were identified (combined ILCR 2×10^{-5}). An ILCR greater than 10^{-4} or HQ greater than 1 is considered under CERCLA to be unacceptable.

Ecological Risk

The Site 2 parcel lies in an area of disturbed soil and ruderal (weedy) terrestrial vegetation that lacks sensitive ecological receptors capable of being significantly affected in an adverse manner by environmental contamination. Wetlands and surface water are not present at the site, but are located approximately 6,800 feet hydraulically downgradient of the site. Wetland and surface ecological receptors are not very sensitive to

VOC contaminants. There are no aquatic habitats, and hence no aquatic biota, on or close to Site 2. Therefore, no formal ecological risk assessment was prepared.

Remedial Action Objectives

The **Remedial Action Objectives (RAOs)** are statements that define the extent to which sites require cleanup to protect human health and the environment and comply with **Applicable or Relevant and Appropriate Requirements (ARARs)**. The RAOs reflect the COCs, exposure routes and receptors, and acceptable chemical concentrations (or range of acceptable chemical concentrations) for soils and groundwater or other hazards (e.g., potential residual MEC) at Site 2. Contaminated soils and groundwater represent a potential threat to human health and the environment. The RAOs for Site 2 are as follows:

- Prevent leaching of contaminants that would continue to impact groundwater in excess of groundwater Proposed RGs.
- Protect future residential receptors from unacceptable risks associated with inhalation and ingestion of VOCs at concentrations in excess of the Proposed RGs in groundwater.
- If necessary to protect off property receptors, minimize or eliminate migration of groundwater contaminated at concentrations greater than the Proposed RGs beyond the property line.
- Comply with chemical-specific, location-specific, and action-specific ARAR's and Guidance.
- Prevent receptors (current recreational users and potential future residential) from coming in contact with potential residual MEC.

Performance criteria under RCRA are established in this section for the purpose of evaluating remedial alternatives and for use in the conceptual design and cost estimates and are the same as CERCLA RGs. Performance criteria provide a basis for further delineating the extent and volume of impacted media that require remediation and provide the design performance of the remedial alternatives. The performance criteria described here

Table 2 - Groundwater - Basis and Proposed Remediation Goals (µg/L)

Chemical of Concern	NYSDOH MCL
1,2/1,4-Dichlorobenzene	5
Chloroform	50
Ethylbenzene	5
1,1,1-Trichloroethane	5
1,1-Dichloroethane	5
Trichloroethene	5
Vinyl Chloride	2
M + p-xylenes	5
O-xylene	5

represent the levels of performance necessary to meet the RAOs. They also provide benchmarks for achieving compliance with ARARs (or when applicable, complying with ARAR waiver criteria).

Except for a no action scenario, a monitoring program capable of demonstrating conformance with the performance criteria (as described below and will be finalized in the **Record of Decision [ROD]** for Interim Remedy) would be an element of each remedial alternative.

As identified in Table 1, the COCs for soils are limited to VOCs (xylenes from residual petroleum contamination) that represent a potential direct contact risk to ecological receptors (if excavated) and/or can leach and adversely impact groundwater quality. Other than xylenes, VOCs were not detected at levels above **NYSDEC** Soil Cleanup Objectives (SCO) for Unrestricted Land Use in subsurface soils. Several metals were also detected in Site 2 soils, but were not detected at concentrations greater than site-specific background values.

The Proposed RGs for soil are presented in Table 1 and consider site-specific risk-based values developed using the HHRA and NYSDEC Soil Cleanup Objectives for Unrestricted Land Use. Achieving these RGs would allow clean closure of this site under both the CERCLA and RCRA programs. Alternative strategies that allow contamination to remain at the site, but achieve the RAOs through long term land and groundwater use restrictions were also developed in the Feasibility Study.

As identified in Table 2, the COCs for groundwater are limited to VOCs. The proposed RGs are presented in Table 2 and consider both site-specific risk-based values developed using the HHRA, **New York State Department of Health (NYSDOH)** MCLs, NYSDEC Surface Water Quality Standards, and USEPA Primary Drinking Water Quality Standards. The performance criteria for groundwater will be the NYSDOH MCLs.

Although 1,4-dichlorobenzene, chloroform, ethylbenzene, and vinyl chloride did not exceed either USEPA MCLs or NYSDOH MCLs during the September 2012 sampling event, detections were still within site-specific risk values for a potential future inhalation pathway (vapor intrusion) and were kept as COCs. In addition, TCA and 1,1-dichloroethane (DCA) were retained as COCs. These chemicals were detected in site groundwater after the 2012 HHRA (2015) and exceeded NYSDOH MCLs.

The performance criteria for MEC will be to prevent exposure to any potential residual MEC. The munitions were mostly likely from a firing stop butt area for testing,

sighting, and performing static target practice using an aircraft 20-mm cannon firing system also located on NWIRP Calverton. Although munitions constituents have not been sampled for in Site media, explosive residues are not likely a site contaminant because the munitions were probably transported from another site (placed as fill material) and not fired at Site 2.

Summary of Remedial Alternatives for Interim Action

This section presents a development and description of remedial alternatives for interim action to manage or treat COCs in soil and groundwater (Alternatives 2 to 5) as well as to address potential residual MEC at Site 2 (Alternatives 6 and 7). In order to develop these alternatives, possible remedial activities were screened for effectiveness, implementability and cost. Based upon the results of the detailed screening of potential remediation technologies, fifteen remedial alternatives were developed and are described as follows.

Alternative 1: No Action

The No Action alternative is required under CERCLA to be evaluated as a baseline for other alternatives.

The No Action alternative does not include institutional controls or remedial activities to identify or minimize risk to public health or the environment. Additionally, the No Action alternative does not include a monitoring program or five-year reviews.

Alternative 2A – LUCs and Monitoring

This Alternative consists of LUCs for soil and groundwater and monitoring of groundwater. The LUCs and monitoring are included in Alternative 2A as a stand-alone response action, but are also a component of Alternatives 2B through 5. LUCs would be used to prevent exposure to site contaminants until the RGs are achieved. The LUCs would consist of restricting on-property activities, including use of contaminated soil and groundwater, and monitoring of off-property areas to ensure there are no impacts to receptors. If necessary, LUCs would notify property owners of residual contamination in groundwater and potential vapor intrusion.

Groundwater monitoring would be conducted to evaluate contaminant migration and cleanup, and the potential need to take additional actions. The groundwater monitoring results and the LUCs would be evaluated on an annual basis and then detailed during the five-year review.

Alternative 6 or 7 would also need to be selected to address potential residual MEC.

Alternative 2B – LUCs, Monitoring, and Treatment of Additional Source Areas

This Alternative consists of LUCs and monitoring as described in Alternative 2A. It also includes the treatment of additional source areas such as underlying soils where there is evidence of a continuing or new release of petroleum or chlorinated solvents. Several buried drums that contained wastes were removed from this area in 2012 through 2015. Alternative 2B would allow selective treatment of soil and groundwater in areas where there is evidence of a continuing or new release of petroleum (using an **ORC**) or chlorinated solvent (using a **hydrogen release compound [HRC]**) (e.g., **HRC**® produced by Regenesis Technologies). This treatment would be used to promote biodegradation of residual contaminants in the soil and groundwater.

Alternative 6 or 7 would also need to be selected to address potential residual MEC.

Alternative 3 – LUCs, Monitoring, Treatment of Addition Source Areas, and HRC-Based Bio Barrier for the Western (TCE) Plume

This Alternative consists of LUCs, Monitoring, and Treatment of Additional Source Areas as described in Alternative 2B. It also includes the installation and operation of a **Bio Barrier** to treat TCE- (or other chlorinated VOC-) contaminated groundwater originating at Site 2. The Bio Barrier would be formed by injecting a mixture of a HRC into groundwater (approximately 20 to 40 feet bgs) to treat TCE-contaminated groundwater flowing through a cross section of the groundwater plume.

Alternative 6 or 7 would also need to be selected to address potential residual MEC.

Alternative 4A - LUCs, Monitoring, Treatment of Additional Source Areas, and Biosparging of Residual Petroleum Contaminated Soil

This Alternative consists of LUCs, Monitoring, and Treatment of Additional Sources as described in Alternative 2B. It also includes the installation and operation of a **Biosparging** System to treat xylene-contaminated soil and groundwater in the eastern portion of Site 2. This Alternative was developed as a contingency remedy to Alternative 2B to address uncertainty with the magnitude of residual xylene-contaminated soil in the eastern portion of the site. Specifically, it would be considered to accelerate cleanup

of soil and groundwater in this area.

Alternative 6 or 7 would also need to be selected to address residual MEC.

Alternative 4B - LUCs, Monitoring, Treatment of Additional Source Areas, Biosparging of Residual Petroleum Contaminated Soil, and Air Sparging at the Property Line

This Alternative consists of LUCs, Monitoring, and Treatment of Additional Sources as described in Alternative 2B. It also includes the installation and operation of a Biosparging System to treat xylene-contaminated soil and groundwater in the eastern portion of Site 2 as described in Alternative 4A and the addition of an air sparging system at the property line. This Alternative was developed as a contingency remedy to Alternative 4A to provide treatment of VOC-contaminated groundwater prior to it flowing off property.

Alternative 6 or 7 would also need to be selected to address potential residual MEC.

Alternative 5 – LUCs, Monitoring, Treatment of Additional Source Areas, Excavation and Offsite Disposal of Residual Petroleum-Contaminated Soil and Excavation, and Air Sparging at the Property Line

This Alternative consists of LUCs, Monitoring, and Treatment of Additional Sources as described in Alternative 2B. It also includes the installation and operation of an Air Sparging system at the property line as described for Alternative 4B. In addition, xylene-contaminated soil in the southeast corner of Site 2 would be excavated under this alternative.

Alternative 6 or 7 would also need to be selected to address residual MEC.

Alternative 6 – Surface Clearing of Potential Residual MEC, Stabilization, and LUCs

This alternative consists of regrading and surface clearance of MEC and the addition of top soil and revegetation to control erosion, LUCs to restrict future use of the site, and maintenance as required for erosion control. This alternative only addresses potential residual MEC at the site and does not address contaminated soil or groundwater.

Alternative 2 through 5 would need to be selected to address soil and groundwater contamination.

Alternative 7 – Excavation and Screening of Potential Residual MEC and Reuse of Soil

Criterion	Alt. 2A LUCs and Monitoring	Alt. 2B LUCs, Monitoring, and Treatment of Additional Source Areas	Alt. 3 – LUCs, Monitoring, Treatment of Additional Source Areas, and HRC-Based Bio Barrier for the Western (TCE) Plume	Alt. 4A - LUCs, Monitoring, Treatment of Additional Source Areas, and Biosparging of Residual Petroleum Contaminated Soil	Alt. 4B - LUCs, Monitoring, Treatment of Additional Source Areas, Biosparging of Residual Petroleum Contaminated Soil, and Air Sparging at the Property Line	Alt. 5 – LUCs, Monitoring, Treatment of Additional Source Areas, Excavation and Offsite Disposal of Residual Petroleum-Contaminated Soil and Air Sparging at the Property Line	Alt. 6 – Surface Clearing of Potential Residual MEC, Stabilization, and LUCs	Alt. 7 – Excavation and Screening of Potential Residual MEC and Reuse of Soil
Overall Protection of Human Health and the Environment	●	●	●	●	●	●	●	●
Compliance with ARARs	●	●	●	●	●	●	●	●
Reduction of Toxicity, Mobility, or Volume through Treatment	○	●	●	●	●	●	●	●
Long-Term Effectiveness	○	●	●	●	●	●	●	●
Short-Term Effectiveness	○	●	○	○	○	○	○	○
Implementability	●	●	○	○	○	○	●	○
Time to Reach RAOs (Years)	30 plus	30	22	30	26	26	Potential residual MEC remains indefinitely.	5
Cost								
Capital	\$75k	\$140k	\$510k	\$780k	\$1.9m	\$5.3m	\$2.1m	\$12m
O&M	\$65k to 120k/Yr	\$42 to 120k/Yr	\$42k to \$11k/Yr	\$42k to 174k/Yr	\$42k to 289k/Yr	\$42k to \$204k/Yr	\$26k to \$56k	\$30k
Present Value	\$2m	\$1.7m	\$2.6m	\$2.6m	\$4.7m	\$7.9m	\$3.1m	\$12m
Ranking:	● High	○ Moderate	○ Low	m = Million.	k = Thousand.			

Table 3 — Relative Ranking of Alternatives

This alternative consists of excavation to soils in the potential residual MEC area until native material is encountered, or otherwise clearing it of MEC, and as feasible, reuse of the screened soil as backfill. This alternative was developed to address all potential residual MEC at Site 2.

Alternative 2 through 5 would need to be selected to address soil and groundwater contamination.

Evaluation of Alternatives for Interim Action

The remedial alternatives for interim action were analyzed in detail and compared to each other using seven of the nine criteria provided in the NCP (40 CFR 300.430 (e)(9)(iii)). An evaluation of the seven site-wide alternatives is provided in Table 3 on page 14, in accordance with the criteria as follows:

Threshold Criteria

- Overall Protection of Human Health and the Environment
- Compliance with ARARs

Primary Balancing Criteria

- Long-term Effectiveness and Performance
- Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment
- Short-term Effectiveness
- Implementability
- Cost

The remaining two criteria, State Acceptance and Community Acceptance, referred to as Modifying Criteria, are also considered in selecting a remedy. NYSDEC has been consulted in selecting the preferred alternative but final State comments will not be submitted until after the community has had an opportunity to submit comments on this proposed plan. Community Acceptance is evaluated based on comments received during the comment period. Additional information on the evaluation criteria can be found on page 19 "How are Remedial Alternatives Evaluated".

Summary of the Preferred Alternative for Interim Remedy

The Navy's preferred alternatives for the interim remedy at Site 2 are Alternatives 2B for soil and groundwater and a modified Alternative 6 for potential residual MEC.

This combination of alternatives are expected to be protective of human health and the environment.

Soil and Groundwater Alternative

The preferred alternative under Alternative 2B consists of LUCs, monitoring of groundwater, and treatment of additional source areas, such as; underlying soils where there is evidence of a continuing or new release of petroleum or chlorinated solvents (Figure 7).

Under Alternative 2B, LUCs would be used to prevent exposure to site contaminants in soil and groundwater until the RGs are achieved. The LUCs would consist of restricting on-property activities, including use of contaminated soil and groundwater, and monitoring of off-property areas and if necessary, notify property owners of residual contamination. Groundwater monitoring would be conducted to evaluate contaminant migration and cleanup, and the potential need to take additional actions. The groundwater monitoring results and the LUCs would be evaluated on an annual basis and then detailed during the five-year review.

The groundwater monitoring would be used to evaluate natural processes that result in decreasing contaminant concentrations with time and/or distance from the source. The most common destructive mechanism for xylenes, TCE, and other VOCs is biodegradation. Although the residual petroleum product can result in a long-term, low-level threat to groundwater, it can also facilitate degradation of TCE and other chlorinated solvents. Also, natural mechanisms such as precipitation, infiltration, and diffusion result in a relatively low rate of oxygen transfer to the petroleum product that would promote degradation of this material and xylenes.

All the known and suspected sources of VOCs have been removed or otherwise treated. Based on groundwater monitoring, Alternative 2B would allow selective treatment of soil or groundwater in areas where there is evidence of a release of petroleum (using an ORC) or chlorinated solvent (using an **HRC**). This treatment would be used to promote biodegradation of residual contaminants in the soil and groundwater.

Under Alternative 2B, groundwater monitoring is estimated to continue for 8 years for the eastern plume (xylenes and TCE) and more than 30 years for the western plume. The estimate for the eastern plume assumes that the xylenes and TCE in the residual soil hotspot area have been effectively depleted by past remedial activities, and the estimate for the western

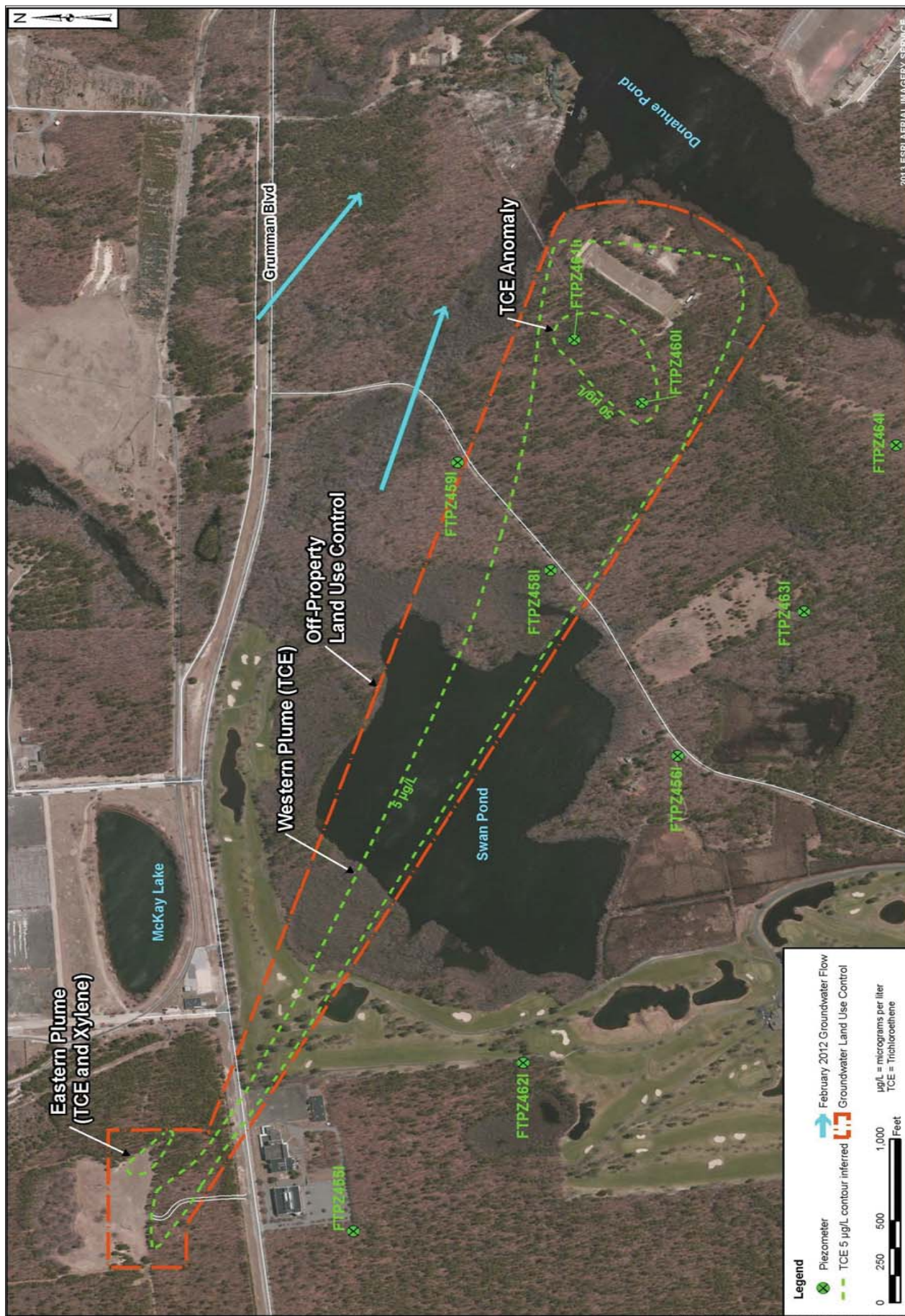


Figure 7 — Alternative 2B Off-Property LUCs and Off-Site Monitoring Well Network

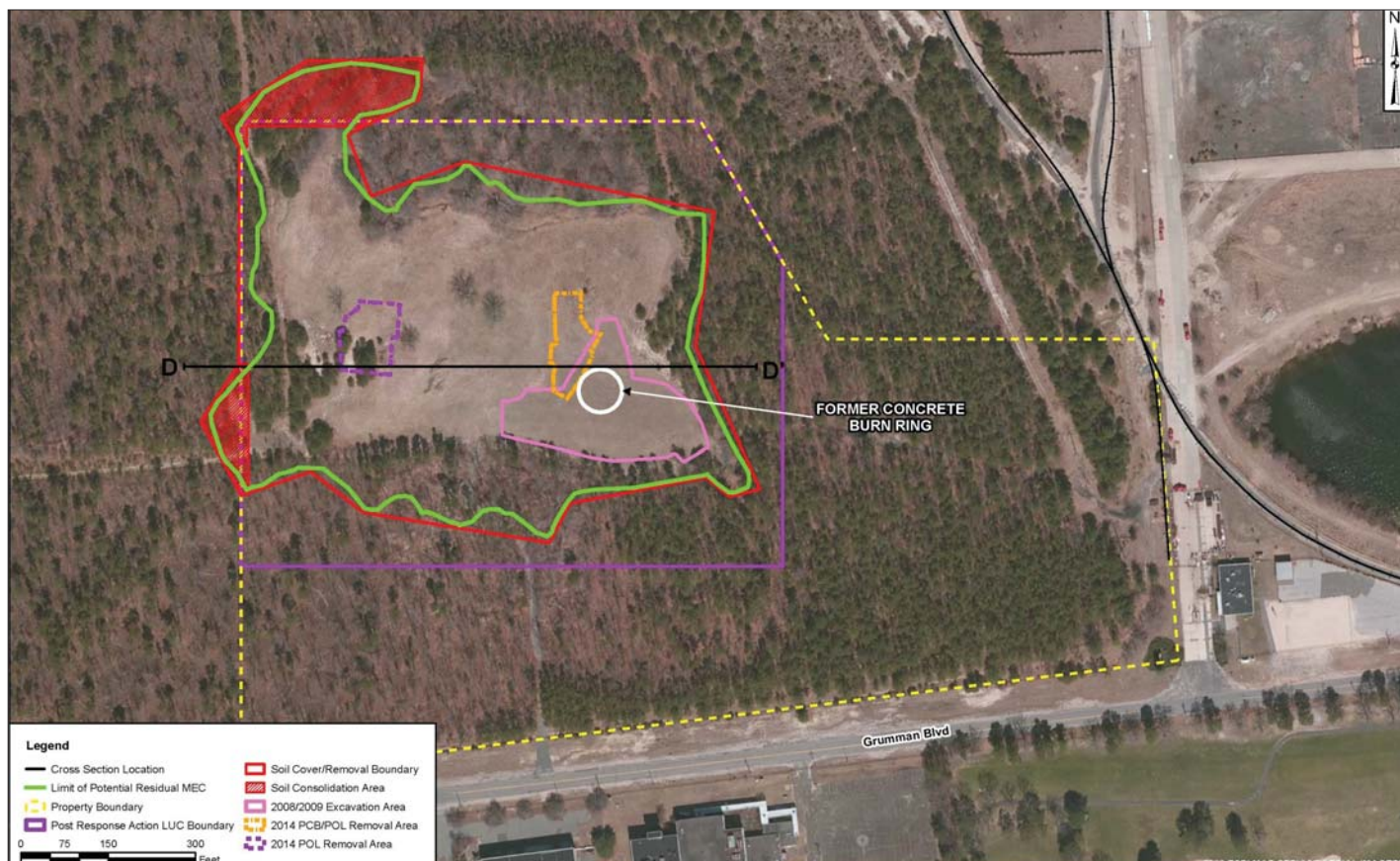


Figure 8 — Modified Alternative 6 Consolidation, Surface Clearing of Potential Residual MEC, Stabilization, and LUCs

plume is dependent on the presence of a continuing source.

For the western plume, the minimum time required to achieve the RGs in groundwater is dependent on the rate of in situ biodegradation, the uniformity of groundwater flow and diffusion, and the contaminant adsorption on soil. Based on a combination of the site-specific factors, but assuming that there is no continuing source of TCE or other VOCs, it is estimated 30 years will be required for the existing groundwater plume to

attenuate. The application of **ORC** and/or **HRC** to source area soil or groundwater would accelerate the cleanup of the on-property groundwater and therefore the off-property groundwater.

Potential Residual MEC Alternative

Under a modified Alternative 6, site activities would consist of consolidation of material on-property, regrading, surface clearance of MEC, and the addition of top soil and vegetation to control erosion, LUCs to restrict future use of the site, and maintenance as required for erosion control (Figure 8 and 9).

This Alternative would be implemented over an area of 10.5 acres. The majority of the vegetation in this area was removed during previous actions at the site. The remaining vegetated areas would be cleared and grubbed. Soils in the Soil Consolidation Area (off-property and on-property) would be excavated until native material is encountered. The material would be consolidated on-property and backfilled with clean material or otherwise cleared of MEC and reused as backfill.

Although surface contours at the site are relatively shallow, limited regrading of the site would be conducted to facilitate placement of the top soil and

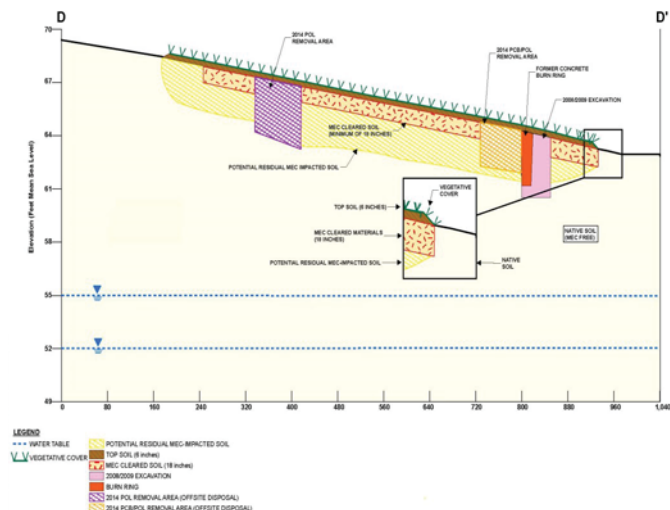


Figure 9 — Modified Alternative 6 Cross Section

control future erosion. Surface clearance of MEC would be conducted after regrading. The top soil would then be placed over the 10.5 acres. A vegetative cover (native grasses) would be planted and maintained over the soil cover.

A minimum of 6 inches of topsoil would be placed over the limits of potential residual MEC. Due to the irregularity of the potential residual MEC boundary, additional topsoil would be required to ensure that areas containing potential residual MEC are covered. Annual site inspections and maintenance activities would be conducted to maintain the cover and control erosion. Top soil would be placed and vegetated in areas of erosion or disturbance (e.g. burrowing animals). Signage notifying of potential residual MEC would be installed, inspected, and replaced if necessary.

LUCs would be used to prevent exposure to potential residual subsurface MEC. The LUCs would consist of restricting on-property activities, including intrusive activities and construction of buildings or other facilities. The LUC boundary would extend a minimum of 10 feet beyond the limits of potential residual MEC and signage would be installed at the site warning receptors about the presence of potential residual MEC in subsurface soils. The LUCs would be evaluated on an annual basis and then detailed during the five-year review .

Costs

The estimated capital and present value cost of the Preferred Alternative (2B) for soil and groundwater are \$75,000 and \$2,000,000, respectively. Annual costs vary significantly based on the activity being conducted in each year and range from \$42,000 to \$120,000 per year.

The estimated capital and present value cost of the Preferred Alternative (modified 6) for potential residual MEC are \$2,600,000 and \$3,600,000, respectively. Annual costs vary significantly based on the activity being conducted in each year and range from \$26,000 to \$56,000 per year.

Alternative Analysis and Selection

The Preferred Alternative was based on a careful evaluation of the nine criteria. Potential exposure to human health is limited and would be further controlled via LUC and monitoring, where necessary.

Based on information currently available, the lead agency believes the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to

the balancing and modifying criteria. The Navy expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA §121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element. The Preferred Alternative can change in response to public comments or new information.

Community Participation

The Navy seeks input from the community on all Proposed Plans. A public comment period has been set for March 16, 2017 to May 15, 2017 to provide an opportunity for public participation in the remedy selection process for this site. A public meeting is scheduled for April 4, 2017 at the Calverton Community Center beginning at 5:30 p.m. At the meeting, the results of the **RFI** and **CMS/FS** will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which you can submit verbal or written comments on the **Proposed Plan**.

The Navy, in consultation with **NYSDEC** and Suffolk County Department of Health Services (SCDHS), may modify the preferred alternatives or select another of the alternatives presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here. Comments will be summarized and responses provided in the **Responsiveness Summary** section of the ROD for Interim Action. This ROD will document the Navy's final selection of the interim remedy for this site. Written comments may be sent to the Public Affairs Officer at the address provided below.

During the comment period, interested parties may submit written comments to the following address:

Public Affairs Officer
Code 09PA
Naval Facilities Engineering Command, Mid-Atlantic
9324 Virginia Ave. Rm. 302
Norfolk, VA 23511-30

How are Remedial Alternatives Evaluated?

The remedial alternatives were analyzed in detail and compared to each other using seven of the nine criteria provided in the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) (40 CFR 300.430 (e)(9)(iii)). These nine criteria are as follows:

Threshold Criteria

- Overall Protection of Human Health and the Environment
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Primary Balancing Criteria

- Long-term Effectiveness and Permanence
- Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment
- Short-term Effectiveness
- Implementability
- Cost

The remaining two criteria, State Acceptance and Community Acceptance, referred to as Modifying Criteria, are also considered in selecting a remedy. NYSDEC has been consulted in selecting the preferred alternative but final State comments will not be submitted until after the community has had an opportunity to participate in the selection process. Community Acceptance is evaluated based on comments received during the public comment period. (See *text box, Let Us Know What You Think!*, on page 1.)

Overall Protection of Human Health and the Environment

Alternatives must be assessed for adequate protection of human health and environment, in both the short and long terms, from unacceptable risks posed by hazardous substances or contaminants present at the site by eliminating, reducing, or controlling exposure to concentrations exceeding remediation goals. Overall protection draws on the assessments of other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

Compliance with ARARs

Alternatives must be assessed to determine whether they attain ARARs under federal environmental laws and state environmental or facility siting laws. If one or more regulations that are applicable cannot be complied with, a waiver must be invoked in accordance with CERCLA. Grounds for invoking a waiver are listed in CERCLA would depend on site circumstances and alternative remedial approaches.

Long-Term Effectiveness and Permanence

Alternatives must be assessed for the long-term effectiveness and permanence they offer, along with the degree of certainty that the alternative will prove successful. Factors to be considered, as appropriate, include the following:

Magnitude of Residual Risk - Risk posed by untreated waste or treatment residuals at the conclusion of remedial activities. The characteristics of residuals should be considered to the degree that they remain hazardous, taking into account their volume, toxicity, mobility, and propensity to bioaccumulate.

Adequacy and Reliability of Controls - Controls such as containment systems and institutional controls that are necessary to manage treatment residuals and untreated waste must be shown to be reliable. In particular, the uncertainties associated with land disposal for providing long-term protection from residuals, assessment of the potential need to replace technical components of the alternative (such as a cap, a slurry wall, or a treatment system), and potential exposure pathways and risks posed if the remedial action would need replacement must be considered.

Reduction of Toxicity, Mobility, or Volume through Treatment

The degree to which the alternative employs recycling or treatment that reduces the toxicity, mobility, or volume will be assessed, including how treatment is used to address the principal threats posed by the site. Factors to be considered, as appropriate, include the following:

- The treatment or recycling processes the alternative employs and the materials that they will treat.
- The amount of hazardous substances, pollutants, or contaminants that will be destroyed, treated, or recycled.
- The degree of expected reduction in toxicity, mobility, or volume of hazardous substances due to treatment or recycling and the specification of which reduction(s) is occurring.
- The degree to which the treatment is irreversible.
- The type and quantity of residuals that will remain following treatment considering the persistence, toxicity, mobility, and propensity to bioaccumulate of such hazardous substances and their constituents.
- The degree to which treatment reduces the inherent hazards posed by principal threats at the site.

Short-Term Effectiveness

The short-term impacts of the alternative are assessed considering the following:

- Short-term risks that might be posed to the community during implementation.
- Potential impacts on workers during remedial action, and the effectiveness and reliability of protective measures.
- Potential environmental impacts of the remedial action, and the effectiveness and reliability of mitigative measures during implementation.
- Time until protection is achieved.

Implementability

The ease or difficulty of implementing the alternatives is assessed by considering the following types of factors, as appropriate:

- Technical feasibility, including technical difficulties and unknowns associated with the construction and operation of a technology, the reliability of the technology, ease of undertaking additional remedial actions, and ability to monitor the effectiveness of the remedy.
- Administrative feasibility, including activities needed to coordinate with other offices and agencies, and the ability and time required to obtain necessary approvals and permits from other agencies (for off-site actions).
- Availability of services and materials, including the availability of adequate off-site treatment, storage capacity, and disposal capacity and services, availability of necessary equipment and specialists and necessary additional resources, availability of services and materials, and availability of prospective technologies.

Cost

Capital costs to be considered include direct and indirect costs, annual O&M costs, and net present worth (NPW) of the capital and O&M costs. The NPW for the alternatives is calculated using a discount rate of 1.4 percent based on the Office of Management and Budget Circular A-94 updated in December 2015. The cost estimate accuracy range is expected to be plus 50 percent to minus 30 percent of the actual cost.

State Acceptance

The state's concerns that must be assessed include the following:

- The state's position and key concerns related to the preferred alternative and other alternatives
- State comments on ARARs or the proposed use of waivers

These concerns cannot be evaluated until the NYSDEC has reviewed and commented on the FS. These concerns will be discussed, to the extent possible, in the Proposed Plan to be issued for public comments.

Community Acceptance

This assessment consists of responses of the community to the Proposed Plan and includes determining which components of the alternatives interested persons in the community support, have reservations about, or oppose. This assessment can be completed after comments on the Proposed Plan are received from the public.

GLOSSARY

Administrative Record: An official compilation of site-related documents, data, reports, and other information that are considered important to the status of and decisions made relative to a Superfund site. The public has access to this material.

Air Sparging: Air sparging reduces concentrations of volatile constituents in petroleum products that are adsorbed to soils and dissolved in groundwater. This technology, which is also known as "in situ air stripping" and "in situ volatilization," involves the injection of contaminant-free air into the subsurface saturated zone, enabling a phase transfer of hydrocarbons from a dissolved state to a vapor phase. The air is then vented through the unsaturated zone.

Air sparging is most often used together with **soil vapor extraction (SVE)**, but it can also be used with other remedial technologies. When air sparging (AS) is combined with SVE, the SVE system creates a negative pressure in the unsaturated zone through a series of extraction wells to control the vapor plume migration. This combined system is called **AS/SVE**.

Applicable or Relevant and Appropriate Requirements (ARARs): Cleanup standards promulgated under federal environmental or state environmental and facility siting laws.

Bioparging: Air is injected into the subsurface to provide additional oxygen to promote/increase biological degradation.

Bio Barrier: is a permeable barrier of organically active material that absorbs, blocks, or degrades contaminants in groundwater as it flows through the barrier.

Chemical of Concern (COC): A contaminant found in site-specific media, deemed by the human health assessment estimation calculation rules to be a compound potentially contributing to human health risk. Chemicals are selected to represent site contamination.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §§ 9601 to 9675: Commonly referred to as Superfund Law., CERCLA is a federal law which was passed in 1980 and amended in 1986 and again in 2002. CERCLA created a special tax that was placed in a trust fund to investigate and cleanup abandoned or uncontrolled hazardous waste sites that endanger public health and safety or the environment.

Contaminant: Any physical, biological, chemical or radiological substance or matter that, at a high enough concentration, could be harmful to human health or to the environment.

Corrective Measures Study (CMS): A corrective measures study (CMS) involves the identification and evaluation of remedial alternatives (i.e. remedies) for performing corrective action at one or more solid waste management units at a Resource Conservation and Recovery Act (RCRA) facility. It is prepared by the facility owner/operator with guidance or oversight from USEPA or an authorized State.

Conceptual Site Model (CSM): A CSM conveys what is known or suspected about contamination sources, release mechanisms, and the transport and fate of those contaminants. The CSM is derived from available data and accepted principles of contaminate fate and transport.

Environmental Restoration Program (ERP): The Navy, as the lead agency, acts in partnership with USEPA and NYSDEC to address environmental investigations at the facility through the ERP. The current ERP is consistent with CERCLA and applicable state environmental laws.

Feasibility Study (FS): Analysis of the practicability of a remedial proposal. The FS usually recommends the selection of a cost-effective alternative.

Groundwater: Water beneath the ground surface that fills spaces between materials such as sand, soil or gravel to the point of saturation. In aquifers, groundwater occurs in quantities sufficient enough for drinking water, irrigation and other uses. As groundwater flows towards its point of discharge, it may transport substances that have percolated downward from the ground surface as it flows towards its point of discharge.

Hazard Index (HI): The sum of chemical-specific Hazard Quotients. A Hazard Index of greater than 1 is associated with an increased level of concern about adverse non-cancerous health effects.

Hazard Quotient: Exposure to a particular non-carcinogenic chemical that may present a risk.

HRC: is formulation of lactic acid, when hydrated, produces a controlled release of hydrogen for periods of up to 12 months on a single application. This product promotes reducing conditions, which enhances anaerobic degradation of chlorinated solvents.

Human Health Risk Assessment: An evaluation of the risk posed to human health should remedial activities not be implemented.

Incremental Lifetime Cancer Risk (ILCR): Exposure to a particular carcinogenic chemical that may present an increased risk of developing 1 additional case of cancer in 10,000. The USEPA acceptable range is 1×10^{-6} to 1×10^{-4} .

Information Repository: A file containing information, technical reports and reference documents developed for a site undergoing cleanup. This file is usually maintained in a place with convenient public access, such as a public library.

Land Use Controls (LUCs): Non-engineered instruments such as administrative and/or legal controls that minimize potential for human exposure to contamination and protect the integrity of the remedy.

Maximum Contaminant Level (MCL): USEPA-published (promulgated as law) maximum concentration level for contaminants found in water in a public water supply system.

Monitoring: Ongoing collection of information about the environment that helps gauge the effectiveness of a cleanup action. This includes the collection of samples with laboratory analysis for the contaminants of interest.

National Contingency Plan; National Oil and Hazardous Substance Pollution Contingency Plan (NCP): The NCP is codified in 40 C.F.R. Part 300. The purpose of the NCP is to provide the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants or contaminants.

New York State Department of Environmental Conservation (NYSDEC): The state agency responsible for administration and enforcement of environmental regulations.

New York Department of Health (NYSDOH): The state agency that promotes health and protects the public from health problems.

Oxygen Reducing Compound (ORC): A formulation of phosphate-intercalated magnesium peroxide or similar compounds that, when hydrated, produces a controlled release of oxygen for periods of up to 12 months on a single application. This stimulates aerobic conditions, which enhances bio-degradation of petroleum hydrocarbons.

Remediation Goals (RGs): Proposed Remediation Goals are generally selected from the most stringent State and Federal criteria.

Proposed Plan: A plan which summarizes the preferred cleanup strategy and rationale. It also reviews the alternative presented in detail in the FS. The Proposed Plan may be prepared either as a fact sheet or a separate document. The preparation of a Proposed Plan is a public participation requirement of CERCLA and the National Contingency Plan.

Public Comment Period: A time for the public to review and comment on various documents and actions taken. A minimum of a 30-day comment period is held to allow community members to review the Administrative Record file and review and comment on the Proposed Plan.

Record of Decision (ROD): An official public document that explains which cleanup alternatives was selected. The ROD is based on information and technical analysis

generated during the RI/FS process and considers public comments and community concerns raised upon the issuance of the Proposed Plan. The ROD explains the remedy selection process and is issued following the conclusion of the public comment period.

Remedial Action: The actual construction or implementation phase that follows the remedial design for the selected cleanup alternative at a site.

Remedial Action Objective (RAO): An objective selected in the FS, against which all potential remedial actions are judged.

Resource Conservation and Recovery Act, as amended, (RCRA), 42 U.S.C. §§ 6901-6939(e): A federal law which ensures 1) the proper management of hazardous waste from the point of generation until final disposal and 2) that an owner and operator of a hazardous waste treatment, storage and disposal facility investigates and cleans up and releases necessary to protect human health and the environment.

Responsiveness Summary: A summary of oral and written public comments received during a comment period following issuance of the Proposed Plan and the responses to these. The responsiveness summary is an important part of the ROD, highlighting community concerns for decision makers.

Risk Assessment: This process evaluates and estimates the current and future potential for adverse human health or environmental effects resulting from exposure to contaminants.

Regional Screening Levels (RSL): USEPA-published (promulgated as law) regional screening levels for contaminants found in soil.

Source Area: The zone of highest soil or groundwater concentrations, or both, of the chemicals of concern. The area considered to be the point of release.

Superfund: Another term used to refer to CERCLA.

United States Environmental Protection Agency (USEPA): The federal agency responsible for administration and enforcement of environmental regulations.

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal grey lines across its entire width, providing a template for handwriting practice or general note-taking. The margins are consistent on all sides.

Your Calendar for the Public Comment Period

Public Comment Period

March 16, 2017 to May 15, 2017

Submit Written Comments

The Navy will accept written comments to the Proposed Plan during the Public Comment period.

A public meeting is planned for April 4, 2017 from 5:30 p.m. to 7:00 p.m. at the Calverton Community Center.



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Public Affairs Officer
Code 09PA
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